

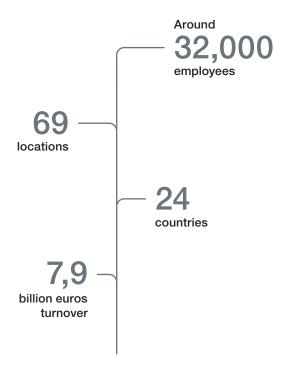
### Excellence Inside ——



#### Contents

- **03** Excellence in Mechatronics
- O4 Shaping mobility experiences
- 10 Increasing efficiency
- 12 Utilizing expertise
- **14** Assuming responsibility

### Brose at a glance



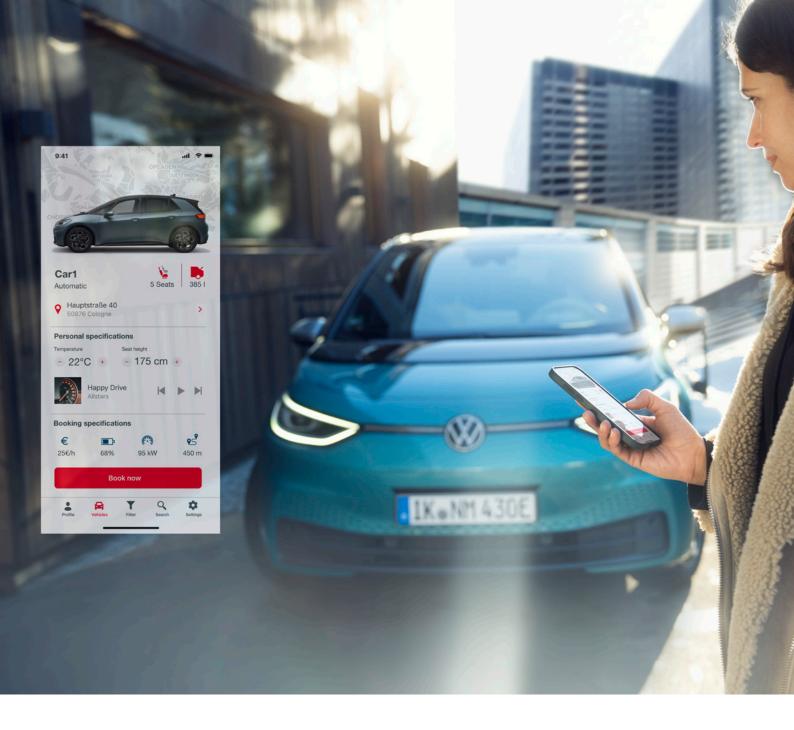


## Excellence in Mechatronics

Brose is one of the five largest family-owned automotive suppliers in the world. Every third new car is equipped with at least one Brose product.

The mechatronics specialist develops and manufactures systems for vehicle doors, liftgates and seats. Brose also produces electric motors from 200 watts to 14 kilowatts for various applications such as steering, thermal management or drives for e-bikes and e-scooters.

The company's intelligent solutions for vehicle access and the interior enhance comfort and flexibility.



## Shaping mobility experiences

Automated driving, electrification and connectivity paired with shared mobility are changing the way we get from point A to point B. The focus is on the demand for more customization, flexibility and comfort.

To satisfy these requirements, we are connecting our mechatronics components with proprietary software and sensor technology to create intelligent systems. This is how Brose is enabling innovative features and shaping new mobility experiences.

#### Convenient access

When approaching the parked car, the vehicle recognizes and welcomes the driver with window projections. The user makes a gesture to signal the desire to enter. The door opens automatically. At the same time, the steering wheel lowers into the dashboard and the seat adjusts automatically to make boarding easier.

This new access experience is made possible by our ability to seamlessly blend our vehicle access and interior

expertise. Our portfolio comprises all of the necessary components from power opening latches and side door drives to collision and anti-trap protection sensors.

Brose brings its experience as a long-standing market leader for power liftgate systems to the development process.



#### Complete control in the side door

In a car-sharing service parking lot, projections in car windows make it easier for customers to select their vehicle – availability, battery charge and pricing are instantly visible.

A new generation of Brose control units coordinates all of the electronic functions in the door – from window regulators to blinds all the way to the side door drive. This also includes innovative concepts such as active noise canceling. The control units can be flexibly integrated into various vehicle architectures.



#### New high-performance sensors

A gesture or flick of the foot is all it takes to "magically" open doors or liftgates. They can also identify obstacles and stop movement before a collision occurs. The same applies to seats that move and fold automatically.

Brose has developed powerful sensors to protect passengers from injury and vehicles from damage. Their precise and reliable functionality makes many new comfort features possible in the first place.



### More safety for pedestrians and cyclists

Electrified vehicles move almost silently through traffic, especially at low speeds. This means that other road users only hear them much later. Therefore, worldwide regulations are in place for the use of warning systems to make electric cars audible.

When developing its own AVAS (Acoustic Vehicle Alerting System), Brose was able to draw on existing technologies for the sound design in the side door and the knowledge of internal acoustics experts. The result was a warning system that generates a high volume level despite its water- and dustproof housing.





#### **Relaxed Loading**

Once functional load carriers, pickup trucks have become an everyday and family car, especially in North America. This also has an impact on customers' requirements in terms of vehicle comfort. One example: easy loading and unloading via the special tailgate of this type of vehicle.

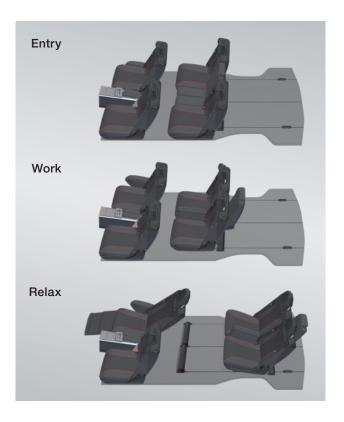
This is why Brose has developed an access system for tailgates based on its side door drive. The system includes latch, control unit, gesture recognition and the drive unit. The latter is only half the size of competing products, which saves costs and weight and facilitates use in tight spaces.

#### Adaptable interior

In the future passengers will decide how they wish to spend their drive. Whether they choose to work, relax or drive the vehicle themselves: electronically controlled seats, screens and storage areas automatically coordinate their positions.

A newly developed Brose rail system allows interior elements to move independently of one another. If desired, the back seat can rearrange to form two individual seats with power adjuster features that allow passengers to fully recline for ultimate relaxation – or the interior can flexibly adapt to offer maximum cargo space. This happens quietly and quickly thanks to our drives.

Integrated cargo modules in the seat rail make it possible to use the entire vehicle as a cargo space. Charging boxes, even pets can be secured by them, e-scooters can be connected to the modules. The modules feature a data and power interface that enables the use of additional services such as battery charging.



#### **Expertise in seat structures**

First and foremost, seats need to be comfortable so that passengers can arrive at their destination relaxed even after a long journey. But the requirements for today's seats are more complex. They protect occupants with airbags, integrated seat belts and headrests, meaning they play a large role in safety within the vehicle.

Brose supplies around eleven million front and rear seat structures annually to vehicle manufacturers throughout the world. Our portfolio ranges from manual seat adjusters to power seat structures with lumbar support and a massage function.

In addition to seat structures, we also offer mechatronic systems for the complete interior such as center consoles with power adjustment. We also use sensor technology and software to connect mechatronic products. This creates intelligent solutions for the vehicle interior.





#### More than a massage

Innovation for a new listening experience: the Brose vibration massage not only has a vitalizing effect and prevents fatigue. On request, specially developed algorithms convert the signal from the sound system into a rhythmic massage, thus enhancing the musical enjoyment.

For greater safety, the tactile feedback also alerts the driver to dangerous situations – for example in the event of microsleep, to support the lane departure warning system or as a call to take over the wheel during automated driving.

#### Safe in every situation

Relax, kick back and unwind. Driving should be a stress-free experience. Vehicle interiors offer occupants more and more comfort, for instance with reclining seats. But if an accident is imminent, things must happen quickly. Passengers must be brought into a safe, upright position before impact.

To make relaxing even safer, we have taken our many years of experience in drives and applied it to electronically commutated motors for seat adjustment. Our seat adjusters change position quicker and quieter than

conventional variants. In the event of an imminent collision, the acoustically optimized drives return vehicle seats to an upright position in fractions of a second to guarantee adequate protection for vehicle occupants.

Getting seats back into the driving position quickly will become even more important as traffic automation increases. If the driver hears a sudden warning "Obstacle ahead, please take control!", he or she must react promptly and take the wheel again to avoid the dangerous situation.



#### Complete seat systems

Seats are a key differentiator in interior design. They have a major impact on the user experience in terms of comfort. E-mobility, autonomous driving and cross-system connectivity are changing the requirements for the interior of tomorrow. Requirements for comfort and safety are supplemented by new and flexible options for personalized design.

Our joint venture Brose Sitech has extensive expertise in the development, assembly and logistics of complete seat systems.





## Increasing efficiency

The electrification of mobility is progressing steadily worldwide. This creates a promising field of growth for Brose and our climate-friendly innovations.

Our power auxiliary systems improve the efficiency of hybrids and e-vehicles alike, which in turn reduces energy consumption, extends range and contributes towards sustainability.

#### Extending reach and maximizing comfort

Alongside the vehicle drive system, air conditioning for the vehicle interior and the battery consume the majority of energy in electric cars – which means that maintaining the ideal temperature during a trip reduces range. Brose significantly increases the efficiency of electric vehicles with its integrated thermal management approach.

The core element of the system is our electric climate compressor. The product works with common operational voltages from 48 to 960 volts and runs with both chemical and natural refrigerants. This enables ultra-fast charging and makes it possible to use the compressor as a heat pump.







#### More efficiency with perfect driving dynamics

Automatic stop-start technology and "coasting" save fuel by switching off the combustion engine and reduce  $CO_2$  emissions. This applies to hybrids as well as to conventional passenger vehicles.

During this process, Brose's electric oil pump maintains oil pressure in the transmission. Driving dynamics are not affected and the vehicle restarts without any time delay. At the same time, the transmission operates more smoothly and quietly.

### Shorter development times thanks to modular concepts

As part of their electrification efforts, manufacturers rely on a variety of electronics architectures with voltages ranging from 48 to 960 volts. This is why Brose engineered a modular motor and electronics system that uses standardized components and interfaces. This makes it possible to adapt our motors and auxiliary systems to a broad range of requirements, even accommodating local differences. Additional advantages of the modular system: independent of the vehicle drive, carmakers benefit from short development times, robust products and economies of scale in global production.



## Utilizing expertise

Brose is transferring its decades of experience in developing and manufacturing electric drives for the automotive industry to other sectors, establishing itself as a system supplier there, too.

Trends such as electrified micromobility are opening up many opportunities and paving the way to new markets.

#### Systems for more driving fun

Brose has been actively involved in the emerging e-bike market since as early as 2014 and is one of the top five suppliers of drives with mid-hub motors in Europe, the strongest sales region. 150 employees at our Berlinbased e-bike competence center develop and produce systems used worldwide in models by more than 30 bicycle brands.

The drives are especially popular among high-performance riders in the sport sector. The Brose portfolio includes drives for any number of applications from city

bikes to mountain bikes along with displays and battery packs. For all components, variants with 48 volts operating voltage have also been available since 2023 – for even better performance. Digital services and the systematic approach are becoming increasingly important in the development of e-bike systems as electrically powered bicycles become more connected. Software-based service tools which dealers and bike shops use for troubleshooting and maintenance are essential elements of our system portfolio. This also includes an app that lets cyclists customize assistance levels and record their routes.

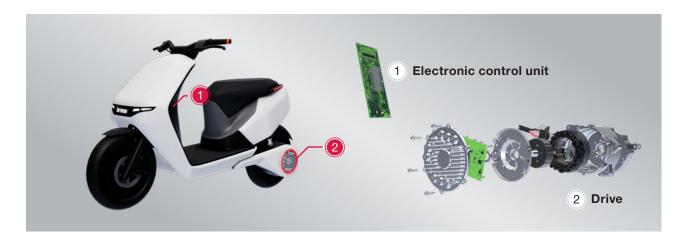


#### Electric scooters

Due to environmental and climate laws, Asia is emerging as a promising market for electrically powered small vehicles like scooters and motorcycles. Brose wants to tap into this potential and started supplying motors, control units and power electronics for e-scooters in India in 2022. In doing this, we are helping to improve the air quality, particularly in cities.

The Brose drive with integrated power electronics is more efficient than other concepts. As a result, it offers up to 20 percent more range. At the same time, the compact design and low weight ensure agile handling.

We are expanding our portfolio to include drives for many different performance classes, software solutions for battery management and conversion kits for conventional two-wheelers.

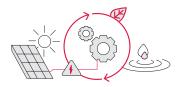




## Assuming responsibility

For more than 110 years, long-term development has been at the center of all we do here at Brose. For us, sustainable work means combining our economic vision with our sense of responsibility toward our employees and the environment.

Our stable ownership structure ensures the continuity required to achieve these objectives. We have set ourselves ambitious targets in our new sustainability strategy to also fulfill our corporate responsibility in the future.



### More efficiency – fewer emissions

Mechatronic systems from Brose help manufacturers shape new comfort experiences – while also offering an advantage for the environment: regardless of the type of vehicle drive, they reduce energy consumption along with emissions.

We achieve these aims with consistent lightweight design while our power auxiliary systems – from air conditioning to steering – boost the efficiency of mechatronic systems in vehicles.



#### Fair treatment

Motivated employees are our most valuable asset. This is why Brose promotes and demands active entrepreneurship. Our employees can help shape the company's success at all levels.

We offer our workforce an attractive working environment, interesting development opportunities and fair compensation. Our family-owned company's values are readily apparent in our uncompromising commitment to occupational safety and health and the respectful way in which we treat each other. For example, trust-based working hours have been in place for our employees for years.



#### Focus on the supply chain

Brose works closely with business partners to ensure the most environmentally friendly life cycle possible for our products.

For instance, we also expect our suppliers to comply with high sustainability standards: alongside quality and price, systematic alignment and compliance with sustainable principles is a requirement when awarding contracts.



### Environmentally conscious product development

For over two decades, we have been recording and evaluating the  $\mathrm{CO}_2$  emissions of our products over their entire life cycle in order to continuously improve their ecological footprint. When developing our products, we pay attention to the efficient and environmentally friendly use of resources, the use of materials with a low carbon footprint and circular economy aspects. With products for e-bikes and e-scooters, we offer innovative solutions for sustainable mobility concepts.



#### Contribution to climate protection

Brose's goal is to become a net carbon-neutral\* company. One milestone on this path is the net carbon-neutral operation of our Brose locations (Scope 1 & 2) from 2025. Increasing energy efficiency and thus reducing energy consumption is a key starting point. Other levers include the procurement and in-house generation of energy from renewable sources. To offset unavoidable emissions, we invest in high-quality compensation projects.

\*CO<sub>2</sub>-neutral means not causing any CO<sub>2</sub> emissions or offsetting any CO<sub>2</sub> emissions through certified compensation projects.



#### Global commitment

We sponsor projects in the areas of sports, education, culture and society in regions surrounding our group locations.

Brose cooperates with partners, initiatives and institutions in 20 different countries. One example is "Gesanghua Education's Aid", a Chinese charity organization that we work with to sponsor the education of 90 disadvantaged children.



# Building **Excellence** Together

At Brose, you are part of a global community of talented employees and smart teams who continuously work to improve our products and processes. After all, true excellence can only be achieved together. That's exactly what makes the difference and drives us forward as a company.

Become part of the success story and join our team!







Follow us

Brose SE

Communications and Marketing

Max-Brose-Straße 1 96450 Coburg

brose.com